$$= \frac{1}{2n+1}$$

Donc

$$\forall n \in \mathbb{N}^*, \quad I_{n+1} + I_n = \frac{1}{2n+1}$$

b) Calculer alors: $J = \int_0^1 \frac{7x^8+7x^6-3x^4+4}{x^2+1}dx$

$$J = \int_0^1 \frac{7u^8+7u^6-3u^4+4}{u^2+1}\,du$$

$$= 7\left(\int_0^1 \underbrace{\frac{u^8}{1+u^2}}_{I_4}\,dx + \int_0^1 \underbrace{\frac{u^6}{1+u^2}}_{I_3}\,dx\right) - 3\int_0^1 \underbrace{\frac{u^4}{1+u^2}}_{I_2}\,dx + 4\int_0^1 \underbrace{\frac{1}{1+u^2}}_{J_0}\,dx$$

Or

$$I_n = \int_0^1 \frac{u^{2n}}{1+u^2}\,dx$$

$$J = 7\left(I_4+I_3\right) - 3.I_2 + 4.I_0$$

$$= 7\left(\boxed{I_4+I_3}\right) - 3\left(I_2+I_1\right) + 3I_1 + 4I_0$$

Qarray.tn -Agra Blech- Qarray.tn